

Technical Appendix 9.2

Benthic Survey Scope and Agreements

Date: 23 August 2022
Our ref: DAS/ A005429
Your ref: Phase 1 Redevelopment at Falmouth Dock



Julia Thompson
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BY EMAIL ONLY

0300 060 3900

Dear Julia

Discretionary Advice Service (Charged Advice)
A005429

Thank you for your email and meeting minutes dated 01 August 2022, which was received on 01 August 2022, along with the proposed transect locations received on 11 August 2022.

This advice is being provided as part of Natural England's Discretionary Advice Service in accordance with the Quotation and Agreement dated 27th June 2022. Ramboll, on behalf of A&P Falmouth, has asked Natural England to:

- Review the proposed benthic scope with technical colleagues and to provide comments to send back to Ramboll.

Please find below general and specific comments for consideration:

General comments

- The methodology refers to 'Figure 2' which shows "indicative sampling locations based on current understanding of the proposed development" – however Fig 2 does not seem to be included in this version of the document. We recognise that sample locations may require micro siting on the day where substrates or locations are unsuitable for access or sampling however we would still like to see the proposed sampling location plan before finalising comment on the methodology and survey programme as a whole.
- During the meeting of 26/07 there was mention of siting some DDV transects out in the deeper water channel to the east, to explore some of the areas of narrowing and shoaling in that channel. While we accept that the majority of the sampling stations will be located in and around the dredge pockets, and therefore not necessarily overlapping with any historic data, we would still recommend that where this overlap with existing, historic data, then those data are used to inform choice of sampling locations. This potential overlap is something we could advise on more fully once we have seen the proposed sampling locations.

Sediment sampling – benthic infauna

- Methodology seems appropriate and we welcome the use of the 0.5mm mesh.

- We would recommend separation of the >1.0mm and the <1.0mm faunal classes by placing a 1.0mm sieve on top of the 0.5mm sieve during sample processing. This should be a straightforward addition to the methodology but would allow typical infaunal statistical analyses / comparisons of the two size classes. This should help with processing of the 0.5mm – 1.0mm size fraction and increase accuracy when looking at the endemic taxa (which will be in the 0.5mm-1.0mm size fraction). Endemic taxa to maerl are currently poorly understood but are an increasing focus of research effort and may in the future become indicators/ listed species in their own right.

Drop Down Video (DDV)

- We welcome the inclusion of planning for stills photos to be taken along each transect. The survey methodology has no mention of the target number of photos planned/ intervals between photos. We would recommend still images should be taken at pre-defined, regularly spaced (or timed) intervals. This can be done manually, with stills taken as close to a defined time interval (e.g. 1 minute) as possible – this would allow for some operator discretion if for example the seabed is not in focus at exactly the pre-defined time. The notes in the methodology presented seem to indicate an opportunistic approach to taking still photos, which can generate problems with bias and/or risk not ensuring good cover of the transect and sufficient stills for statistical analysis.
- For more detail, see Hitchens *et al.* (2015) – NMBAQC standard text. We would welcome seeing this reference mentioned and NMBAQC guidelines fully adhered to.

For clarification of any points in this letter, please contact myself, Esther Hughes, on the telephone number below or via email esther.hughes@naturalengland.org.uk

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely,

Esther Hughes

Marine Lead Adviser

Devon, Cornwall & Isles of Scilly Team

Natural England, Polwhele, Truro, Cornwall, TR4 9AD

Mobile 07442 856295

RE: Proposed Transect Locations for Falmouth Dock Development

NE comments contained within the DAS letter (Ref: A005429) dated 23 August 2022 are presented below, and our responses are included below in *italicised red type*.

General comments

- The methodology refers to 'Figure 2' which shows "indicative sampling locations based on current understanding of the proposed development" – however Fig 2 does not seem to be included in this version of the document. We recognise that sample locations may require micro siting on the day where substrates or locations are unsuitable for access or sampling however we would still like to see the proposed sampling location plan before finalising comment on the methodology and survey programme as a whole.

Reference to Figure 2 is a typo. Figure 1, which is included in the scope provided, contains all proposed sampling locations. This typo will be corrected in the updated scope. Acknowledge NE acceptance of micro-siting during survey operations based on conditions etc.

- During the meeting of 26/07 there was mention of siting some DDV transects out in the deeper water channel to the east, to explore some of the areas of narrowing and shoaling in that channel. While we accept that the majority of the sampling stations will be located in and around the dredge pockets, and therefore not necessarily overlapping with any historic data, we would still recommend that where this overlap with existing, historic data, then those data are used to inform choice of sampling locations. This potential overlap is something we could advise on more fully once we have seen the proposed sampling locations.

Figure 1 in the scope does show the location of the proposed transects out in the main channel. These have been sited based on our understanding of the development proposals and are located in the areas of narrowing / shoaling. These locations do not overlap with any historic data as none was in the vicinity of the proposed development. The aims of these surveys are to provide baseline characterisation of the area to inform the environmental impact assessment process. They are not to review changes in the environment that may have occurred since previous surveys were undertaken in the wider Fal Estuary as those locations do not overlap with the anticipated area of impact.

Sediment sampling – benthic infauna

- Methodology seems appropriate and we welcome the use of the 0.5mm mesh.

Noted with thanks.

- We would recommend separation of the >1.0mm and the <1.0mm faunal classes by placing a 1.0mm sieve on top of the 0.5mm sieve during sample processing. This should be a straightforward addition to the methodology but would allow typical infaunal statistical analyses / comparisons of the two size classes. This should help with processing of the 0.5mm – 1.0mm size fraction and increase accuracy when looking at the endemic taxa (which will be in the 0.5mm-1.0mm size fraction). Endemic taxa to maerl are currently poorly

understood but are an increasing focus of research effort and may in the future become indicators/ listed species in their own right.

No grabbing within live Maerl habitats is proposed to prevent damage – suitability of grab locations will be confirmed with a drop-down camera prior to grabbing so collection of taxa endemic to live maerl is unlikely, although grabbing will collect endemic taxa associated with dead maerl substrates. We will incorporate separation of >1.00 mm and <1.00 mm fractions in methodology. Scope text updated to this effect.

Drop Down Video (DDV)

- We welcome the inclusion of planning for stills photos to be taken along each transect. The survey methodology has no mention of the target number of photos planned/ intervals between photos. We would recommend still images should be taken at pre-defined, regularly spaced (or timed) intervals. This can be done manually, with stills taken as close to a defined time interval (e.g. 1 minute) as possible – this would allow for some operator discretion if for example the seabed is not in focus at exactly the pre-defined time. The notes in the methodology presented seem to indicate an opportunistic approach to taking still photos, which can generate problems with bias and/or risk not ensuring good cover of the transect and sufficient stills for statistical analysis.

This approach will be adopted during the survey operations, an opportunistic approach will still be used where specific features are observed or changes in substrate type occur and need to be documented.

- For more detail, see Hitchens et al. (2015) – NMBAQC standard text. We would welcome seeing this reference mentioned and NMBAQC guidelines fully adhered to.

Reference to this guidance will be included in scope.

A brief request for any additional information was requested, and a response received on 07 September 2022. The comments are presented below and our responses in *italicized red type*

- Exact number of video transects: Would it be possible to have confirmation of the number being carried out?

As shown in Figure 1, 15 no. video transects will be carried out. This number has been added to the scope.

- Number of sediment sampling points is approximate. Has this number been revised? It would be useful to see where samples will be taken.

As shown in Figure 1 and discussed in scope – we will aim to collect 30 samples but the exact number will be subject to substrate suitability. Indicative locations shown on Figure 1 but micro-siting might be necessary.

- Please can you confirm planned length of DDV transect. It is stated that they will be less than 100m – have exact lengths been decided at this stage?

Between 80 and 100 m. Exact length dependent on on-site conditions during survey operations, although typically there will be some run-in and out of the transect so a longer transect often results.

- There are no sampling sites immediately to the east of the jetty (there is quite a big gap between the jetty and the channel sample locations). Please can you tell us about this gap?

The main survey area is immediately surrounding the dock structures as this is the main focus of the development. DDV transects/grab locations in the main channel are sited to capture information

about possible dredge pockets but are an additional component – so not necessary to infill gap between docks and channel.

- Regarding the separate survey for the MMO in terms of the chemical sampling, are there plans around mitigation during the dredging period?

Sediment chemistry sampling and analysis is a totally separate survey operation, not subject to this scope.

- The plan indicates that the sediment sampling is to determine the suitability of the sediments for dredge disposal but also discuss identifying suitable disposal locations in the vicinity of the proposed works. Are the stations selected also for this purpose? There is concern over the fate of any sediments dredged especially as they are likely to contain various contaminants that could be remobilised as a consequence of any dredging and disposal operations.

Sediment sampling described within this scope is only used to provide PSD information to support the fauna analysis. Sediment chemistry analysis for marine licenced disposal suitability is a totally separate survey operation.



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Tel: 023 8129 0095

Ref: Port of Falmouth – Marine Ecological Survey

Dear Sir/Madam,

Carcinus Ltd. have been contracted by Ramboll UK Ltd., on behalf of Falmouth Docks and Engineering Company (FDEC), to undertake marine ecological surveys in support of the proposed development at the Port of Falmouth, Cornwall. Works are anticipated to include an extension to Queen's Jetty, northern infill and dredging of Queen's Jetty, removal of the Northern Arm, construction of a new Western Wharf and dredging of the area around it.

It is understood that no HRO is required for the proposed development as FDEC are the statutory harbour authority and have powers to undertake works under sections 6 and 7 of the *Falmouth Docks Act 1959*, 1959). A marine licence is required under the *Marine and Coastal Access Act 2009* and planning permission from Cornwall County Council is likely to be required under the *(Town and Country Planning Act 1990*, 1990. Marine ecological surveys and sediment chemistry sampling are required to inform both the planning permission application and future marine licence application. Please note that in addition to the marine ecological sampling, samples will also be collected for the purposes of characterising sediments for disposal at a licenced marine disposal site. The process and proposed sample array for the collection of these samples is subject to a separate scope.

We seek advice from Natural England, the MMO and the Cefas Benthic Team on the suitability of our proposed marine ecological sampling plan, as detailed below and within the accompanying information uploaded with this enquiry.

Existing site and background

The Fal estuary complex is situated in southwest England, and the Port of Falmouth is located at the mouth of the River Penryn on the western side of the estuary complex. The estuary at this point is predominantly subtidal, and although extensive intertidal areas exist farther up the estuary complex, the marine environment under consideration here is entirely subtidal. The Fal and Helford Special Area of Conservation (SAC) was designated in 2004 (JNCC, 2004), primarily due to the presence of Maerl Beds of *Phymatolithon calcareum* and *Lithothamnion corallioides*. The Fal complex contains the largest maerl beds in south-west Britain. Maerl beds, both live and dead, provide significant 3-dimensional habitat complexity that supports a high diversity of marine flora and fauna (Hall-Spencer, Kelly and Maggs, 2010).

A bathymetric, multibeam backscatter (MB) and side-scan sonar (SSS) survey of the site was conducted in March 2022. The results of this acoustic survey were used to inform the design of an indicative drop-down video (DDV) survey of the waters around the Port to confirm the presence / absence of both live and dead maerl, characterise the biotopes and identify any notable flora and fauna along a series of transects. This DDV survey was conducted in May 2022 (Report Ref: J0654/22/05/23_Port_Falmouth_DD_V_Survey_Report), and the results have been used to help define the proposed scope outlined in this letter.

At present, no proposed dredge disposal site has been identified. At this stage within the project, it is required that we undertake sampling to ascertain if sediments are suitable for marine dredge

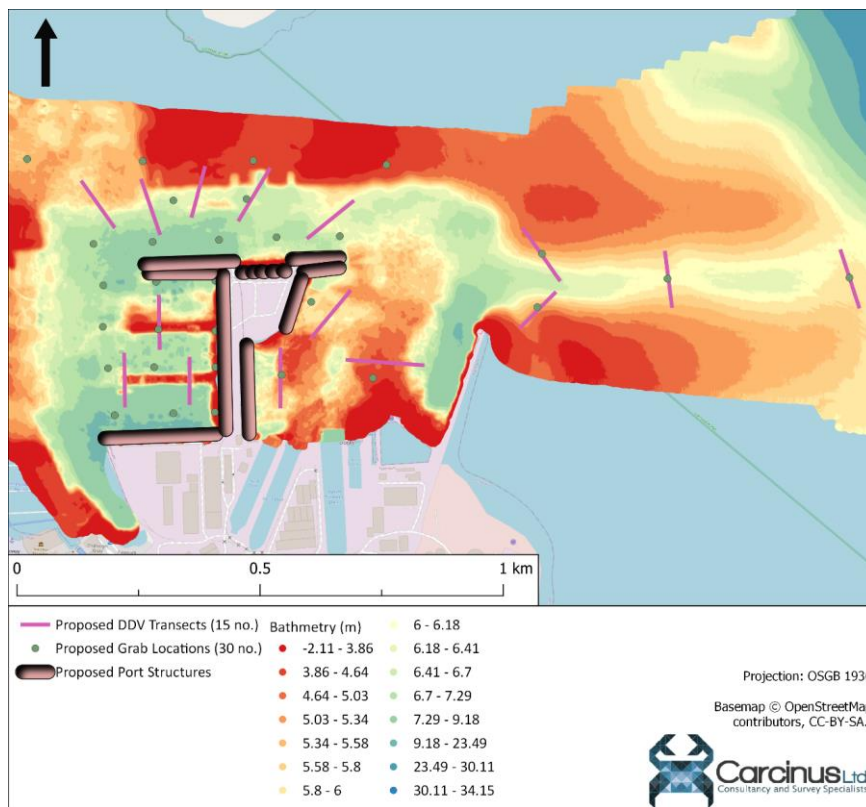
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disposal and that sampling be combined with the marine ecological sampling programme if possible (to be completed before the end of October to maximise efficiencies). In a separate sampling request to the MMO, we will seek advice in relation to potentially suitable disposal sites within the vicinity of the proposed works and seek agreement on a sediment chemistry survey specification / design.

Survey Operations

Mobilisation for the survey will take place from a convenient local harbour / port capable of accommodating the required survey vessel proposed. At this stage, it is highly likely that the Port of Falmouth will be used for mob/demob and the vessel MV Solent Guardian is anticipated to be used to conduct all survey operations.

[Figure 1](#) shows the proposed sampling/survey locations for the various methodologies described below.



[Figure 1 - Proposed locations of various subtidal survey methodologies.](#)

Subtidal Benthic Ecological Survey

A Day grab will be used to collect a series of infauna samples within and around the proposed construction and dredge areas. Given the proposed construction and dredge areas, it is proposed to

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collect approximately 30 samples in a pseudo-randomised array across the survey area. A single replicate sample will be obtained at each site. The survey will be undertaken by 2 – 3 experienced marine ecologists. Upon recovery, the grab bucket will be viewed to ensure enough sample has been collected and that the sample has not been compromised in any way.

The proposed methodology and survey programme are described in the table below.

Sediment sampling – benthic infauna	
Proposed survey timing	Precise survey timings are yet to be determined. However, once agreed the survey will take consideration of existing vessel traffic. The survey is proposed to take place in September or early October 2022. The study area includes numerous hard port structures which are likely to be subject to wash and seabed disturbance from the movements of existing vessel traffic. Biogenic habitats or macroalgal communities are anticipated. Any stochastic events which may have impacted the benthic environment, such as anomalously cold, high freshwater flows or stormy weather will be considered.
Requirement / approach	To collect samples at selected locations within the study area for macrofauna analysis. Based on our understanding of the proposed development, we have allowed for the collection approximately 30 samples.
Equipment	Samples will be collected using the following apparatus: • 0.1 m² stainless steel Day grab to collect infauna samples; • Sample processing hopper, sieving chute and puddling bin; • 0.5 mm mesh sieve • Vessel RTK GNSS or DGPS (with offset for deployment location); and • Digital deck camera.
Data collection method	All grab samples will be handled in line with Cefas, Ware and Kenny and JNCC guidelines. A Day grab will be utilised to collect infauna samples. It is proposed to undertake sampling at 30 pseudo-randomly selected sites, with one replicate sample obtained at each. Although the precise sampling locations have not been determined, they will take consideration of a range of water depths and habitats within and surrounding the proposed dredge pocket(s). The accompanying plan (Figure 2) shows indicative sampling locations based on current understanding of the proposed development. In addition, sample locations may require micro siting where substrates are unsuitable for sampling by Day Grab, or obstructions to access exist, such as other vessels, moorings etc. The survey will be undertaken by 2 - 3 experienced marine ecologists. They will be responsible for the launch and recovery of the grab and the subsequent sample processing. Prior to deployment of the grab, a Drop-Down Video camera will be used to give an indication of the substrate. This is to maximise the likelihood that a suitable sample will be collected, and to prevent accidental damage of protected live maerl habitats. Upon recovery, the grab bucket will be viewed to ensure enough sample has been collected and that the sample has not been compromised in any way. The following criteria will apply in determining sample acceptability, should any conditions apply the sample shall be rejected: • Sediment washout caused through the grab jaws or doors not closed properly; • Sample taken on an angle i.e. where the grab has not struck the seabed true; • Disruption of the sample through striking the side of the vessel; • Sample too small for requirements (Minimum sample size for 0.1 m² Day grab of < 7 cm bite depth. • Sample is collected beyond positional tolerance (to be within 5m of target location);

Sediment sampling – benthic infauna

- The presence of a Hag Fish (*Myxine glutinosa*) and/or other mucous coagulants; and
- Unacceptable to the on-board ecologist or client representative for any other reason.

If the sample is deemed acceptable, the sample will be released into a sample hopper and a visual description and photograph taken. Any conspicuous sediment features and obvious fauna will be recorded.

The sample will then be processed in its entirety by being sieved through a 0.5 mm mesh (NB: substrate in study area is expected to include areas of soft mud, therefore a 0.5 mm mesh shall be used to ensure greater retention of meiofauna). The sieve will be placed at the end of the sieving chute and rinsed to remove residual sediment via a puddling bin. All sieves used for macrofauna processing will conform to BS410 or ISO 3310- 1 (woven wire sieves) or ISO 3310-2 (perforated plate sieves). Following sieving, the sieved sample shall be photographed while still on the sieve with a photo tag denoting date, station and replicate number. The sample will then be transferred into pre- labelled bucket and preserved on site with 4% buffered saline formaldehyde solution. All necessary PPE shall be worn during sample fixing.

During subsequent laboratory analysis to identify the faunal composition, the sample will be divided between >1.0 mm and <1.0 mm individuals to facilitate statistical comparison. This will be done in the laboratory as it would be prohibitively time-expensive and impractical (risking sample loss and poor sieving efficiency) to do in the field.

At each sampling site, an additional grab sample shall be collected (adhering to the same sample acceptability criteria outlined above) and a 10 cm hand core taken from surface of sediment to bottom of grab to be processed for sediment Particle Size Distribution (PSD) analysis to support later interpretation of infauna results. All samples shall be analysed to relevant British Standards and NMBAQC methods by a laboratory accredited by UKAS to the ISO 17025:2005 standard.

Drop Down Video

Drop Down Video (DDV)	
Requirement	To acquire data of suitable resolution to enable characterisation of the benthic ecology inhabiting the subtidal rock located to the north of the approach channel.
Equipment	Digital video and stills of the seabed will be collected using the following apparatus (or of comparable performance / specification): • Drop camera system featuring: - 'On-the-fly' image download - Real time video - LED lamps - Dual lasers for scale - High speed digital telemetry link to camera and sensors • ESW-500 Electric survey winch fitted with loadbearing subsea camera telemetry cable; • HYDROpro™ Navigation Software for fixing positions and recording vessel and equipment tracks – accounting for positional offsets; and

Drop Down Video (DDV)	
	Differential (d)GNSS for positioning.
Data collection method	The May 2022 DDV survey covered 25 transects over a relatively wide area. The exact number of transects proposed is not known at this stage, but it is likely that a slightly smaller number of transects will be completed but over a much smaller area (Figure 1 indicates 15 no. transects, although the exact length/position/number may be varied on the day due to on-site conditions and other factors). Please note that the transects will be constrained by the safe operation of the vessel in relation to draught taking account of the depth of water. As such, each transect will not be more than approximately 5100 m in length (with some run-in and out of the transect). It is proposed that a drop system be used with the camera mounted at ~45° to produce an oblique image of the seabed. This will give depth to the image to allow a feature's dimensions to be assessed in accordance with the guidelines. Scale will be determined by the in-shot dual lasers. The general method for the conduct of DDV surveying will be based on published NMBAQC Guidance (Hitchin, Turner and Verling, 2015). JNCC Procedural Guideline No. 3-5 Identifying biotopes using video recordings (Holt and Sanderson, 2001). The DDV system will be deployed by two experienced marine ecologists with assistance from a qualified survey engineer. Sufficient run-in distance will be given to allow the DDV system to be fully deployed prior to the start-of-line (SOL) ensuring the entire transect(s) is recorded. The position and depth of the DDV system will be monitored in real-time via the output from the dGNSS augmented by the live camera feed. Deployment will stop at ~50 cm from the seabed with the vessel moving slow ahead. Recording will commence just prior to the SOL and will end once the DDV system has passed the end-of-line (EOL) with the DDV being 'flown' along the transect. The video will be geo-referenced and contain an overlay delineating the date, time, position of camera, transect number and depth of camera. Data quality will be assessed by the on-board ecologists to ensure sufficient image quality is obtained. Continuous video footage will be collected as well as a series of high-quality stills images. Stills images will be collected throughout each transect as appropriate (i.e., where key features exist, changes in bed composition etc.). Detailed survey logs will be maintained throughout the survey to record transect number, position (start and end of line), time, depth, number of stills and any other noteworthy observations.

Drop Down Video (DDV)



Port Inspection

Port Structures: ROV Inspection	
Proposed survey timing	No seasonal restrictions or considerations are required except to avoid sampling immediately after significant storm events where turbidity levels are likely to be elevated. Every effort will be made to run this survey concurrently with the other survey elements to maximise efficiency.
Requirement	During the May 2022 Survey, a brief inspection of the above-water port structures was undertaken. Several of these structures were observed to be in a state of mild disrepair. As a result of this, a more complete inspection of the above and below-water structures will be undertaken during this survey. This survey will incorporate the port structures that extend out into the channel such as the Queens Jetty and the Northern Wharf, as well as concrete walls and piles, and rock armouring within those areas. Where piles/walls are surveyed, a selection of the area will be inspected from surface to substrate. The surveyed areas will be representative of the area but not 100% coverage as it is considered that this would take a prohibitively long amount of time.
Equipment	The following equipment is required: - BlueRobotics BlueROV2, featuring: - A HD 1080p video camera with live feed and overlay of data; - Additional 4K video camera 4 No. 1500 Lumen lights (adjustable brightness) - Depth, compass and attitude data streams - Depth rated to 120m - HYDROpro™ Navigation Software for fixing positions and recording vessel and equipment tracks – accounting for positional offsets; and - Differential (d)GNSS for positional accuracy to <50 cm.
Data collection method and analysis	Footage will be viewed in real time by the on board ecologist to provide a means of recording conspicuous fauna, noting the apparent condition of port structures and monitoring survey parameters (e.g., visibility, camera angle, relative position etc.). A detailed survey log will be maintained throughout the deployment along with the presence of any sensitive nature conservation features, such as Annex I habitats and Annex II species. Data collection via ROV is now an accepted method by the Statutory Nature Conservation Bodies. This is reflected within the industry standard guidance manual (The Marine Monitoring Handbook) produced by the Joint Nature Conservation

Port Structures: ROV Inspection

Committee. All survey operations used during this project will align with those stipulated in the guidance.

Analysis

Infauna samples

To analyse the macro fauna samples collected from the day grab / intertidal cores, a laboratory which is a full-time participant in the UK National Marine Biological Association Quality Control Scheme (NMBAQC) will be used. All laboratory techniques are documented and adhere to NMBAQC protocols and ISO 16665.

Data will be analysed to describe community structure and distribution and to elucidate relationships between faunal assemblages and physical variables. A suite of statistical routines shall be employed to investigate community structure and relationships with abiotic factors where appropriate. The characterisations will include definition of the different types of habitats present and the animal communities that are associated with them. Biotopes will be defined from a synthesis of the physical and biological data and compared to the UK Marine Habitat Classification system.

In addition, all samples will be analysed for Particle Size Distribution (PSD) to provide additional information for interpretation.

Yours faithfully,



Matthew Crabb

Director and Principal Consultant – Carcinus Ltd



References

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Hall-Spencer, J.M., Kelly, J. and Maggs, C.A. (2010) *Background Document for Maerl Beds*.

Hitchin, R., Turner, J.A. and Verling, E. (2015) *Epibiota Remote Monitoring from Digital Imagery: Operational Guidelines*. NMBAQC, p. 29. Available at: https://www.nmbaqcs.org/media/mirhlqmu/epibiota_operational_guidelines_final.pdf.

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Town and Country Planning Act 1990 (1990). London: HM Government. Available at: <https://www.legislation.gov.uk/ukpga/1990/8/contents> (Accessed: 23 June 2022).

~~*Falmouth Docks Act 1959* (1959). London: HM Government. Available at: <https://www.legislation.gov.uk/ukla/Eliz2/7-8/40/enacted> (Accessed: June 23, 2022).~~

~~Hall-Spencer, J.M., Kelly, J. and Maggs, C.A. (2010) *Background Document for Maerl Beds*. 491/201036pp.~~

~~Holt, R. and Sanderson, B. (2001) "Procedural Guideline No. 3-5: Identifying biotopes using video recordings," in Davies, J. et al. (eds) *Marine Monitoring Handbook*. JNCC, pp. 241-251.~~

~~JNCC (2004) *Fal and Helford - Special Areas of Conservation, Special Areas of Conservation: Sites*. Available at: <https://sac.jncc.gov.uk/site/UK0013112> (Accessed: June 23, 2022).~~

~~*Marine and Coastal Access Act 2009* (2009). HM Government. Available at: <https://www.legislation.gov.uk/ukpga/2009/23/contents> (Accessed: June 23, 2022).~~

~~*Town and Country Planning Act 1990* (1990). London: HM Government. Available at: <https://www.legislation.gov.uk/ukpga/1990/8/contents> (Accessed: June 23, 2022).~~

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Rachel Holloway

From: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>
Sent: 20 September 2022 08:06
To: Julia Thompson
Cc: Sugar, Kate; Daniel Hamp; Rachel Holloway
Subject: Re: Proposed Transect Locations for Falmouth Docks Development

Dear Julia,

Thank you for the updated scope and summary note. We have reviewed and are happy with these, with track changes/comments in.

Looking forward to meeting with you this morning.

Kind regards,
Esther

Esther Hughes([she/her](#))

Marine Lead Adviser

Devon, Cornwall & Isles of Scilly Team

Natural England, Polwhele, Truro, Cornwall, TR4 9AD

Mobile07442 856295

Please note that my work days are **Monday, Tuesday, & Wednesday**(09:00 – 17:00)

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From: Julia Thompson <julia.thompson@ramboll.co.uk>
Sent: Tuesday, September 13, 2022 4:00 pm
To: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>
Cc: Sugar, Kate <Kate.Sugar@naturalengland.org.uk>; Daniel Hamp <daniel.hamp@ramboll.com>; Rachel Holloway <Rachel.Holloway@ramboll.co.uk>
Subject: RE: Proposed Transect Locations for Falmouth Docks Development

Hi again Esther,
Please find attached an updated scope and a summary note to outline the changes made following your comments for ease of understanding. We have kept track changes in for the time being so you can see the changes easily, we will finalise once we receive your approval.

Are you able to review and respond to let us know you are happy with the benthic scope so we can have this as written approval?

Kind regards
Julia

Julia Thompson (she/her)
Senior Consultant

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At Ramboll we work flexibly and across time zones -
so while it suits me to email now, I do not expect a response
or action outside of your own working hours

RAMBOLL

From: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>

Sent: 07 September 2022 13:15

To: Julia Thompson <julia.thompson@ramboll.co.uk>

Cc: Sugar, Kate <Kate.Sugar@naturalengland.org.uk>; Daniel Hamp <daniel.hamp@ramboll.com>; Rachel Holloway <Rachel.Holloway@ramboll.co.uk>

Subject: RE: Proposed Transect Locations for Falmouth Docks Development

Hi Julia,

Apologies for my delay in replying to you.

Thank you for letting us know about the figure numbers. Yes, you are correct, Figure 1 is the one we were referring to.

Regarding further comments, I do have some more (see below) which may have already been covered, but worth mentioning just in case:

- Exact number of video transects: Would it be possible to have confirmation of the number being carried out?
- Number of sediment sampling points is approximate. Has this number been revised? It would be useful to see where samples will be taken.
- Please can you confirm planned length of DDV transect. It is stated that they will be less than 100m – have exact lengths been decided at this stage?
- There are no sampling sites immediately to the east of the jetty (there is quite a big gap between the jetty and the channel sample locations). Please can you tell us about this gap?
- Regarding the separate survey for the MMO in terms of the chemical sampling, are there plans around mitigation during the dredging period?
- The plan indicates that the sediment sampling is to determine the suitability of the sediments for dredge disposal but also discuss identifying suitable disposal locations in the vicinity of the proposed works. Are the stations selected also for this purpose? There is concern over the fate of any sediments dredged especially as they are likely to contain various contaminants that could be remobilised as a consequence of any dredging and disposal operations.

Kind regards,
Esther

Esther Hughes ([she/her](#))

Marine Lead Adviser

Devon, Cornwall & Isles of Scilly Team

Natural England, Polwhele, Truro, Cornwall, TR4 9AD

Mobile 07442 856295

Please note that my work days are **Monday, Tuesday, & Wednesday** (09:00 – 17:00)

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From: Julia Thompson <julia.thompson@ramboll.co.uk>

Sent: 05 September 2022 14:05

To: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>

Cc: Sugar, Kate <Kate.Sugar@naturalengland.org.uk>; Daniel Hamp <daniel.hamp@ramboll.com>; Rachel Holloway <Rachel.Holloway@ramboll.co.uk>

Subject: RE: Proposed Transect Locations for Falmouth Docks Development

Hi Esther,

The team at Carcinus noted that your comments refer to a Figure 2 which doesn't exist and have noted that Figure 1 contains all the sampling positions so would you be able to confirm if this addresses your concerns/on the back of this do you have any further comments to make once this is taken into consideration?

Kind regards
Julia

Julia Thompson (she/her)

Senior Consultant

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julia.thompson@ramboll.co.uk

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RAMBOLL

From: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>

Sent: 05 September 2022 13:12

To: Julia Thompson <julia.thompson@ramboll.co.uk>

Cc: Sugar, Kate <Kate.Sugar@naturalengland.org.uk>; Daniel Hamp <daniel.hamp@ramboll.com>; Rachel Holloway <Rachel.Holloway@ramboll.co.uk>

Subject: RE: Proposed Transect Locations for Falmouth Docks Development

Hi Julia,

Yes please, this would be useful, if possible.

Kind regards,
Esther

From: Julia Thompson <julia.thompson@ramboll.co.uk>

Sent: 23 August 2022 15:52

To: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>

Cc: Sugar, Kate <Kate.Sugar@naturalengland.org.uk>; Daniel Hamp <daniel.hamp@ramboll.com>; Rachel Holloway <Rachel.Holloway@ramboll.co.uk>

Subject: RE: Proposed Transect Locations for Falmouth Docks Development

Thanks Esther,
I've passed this onto the team at Carcinus to review, for our benefit would you require to see this again once updated in order to provide written approval of the scope?

Kind regards
Julia

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RAMBOLL

From: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>

Sent: 23 August 2022 15:10

To: Daniel Hamp <daniel.hamp@ramboll.com>; Julia Thompson <julia.thompson@ramboll.co.uk>

Cc: Sugar, Kate <Kate.Sugar@naturalengland.org.uk>

Subject: RE: Proposed Transect Locations for Falmouth Docks Development

Hi Julia and Daniel,

I hope you are both well.

Please find attached our technical feedback after reviewing the proposed benthic scope and proposed transect locations.

Please do not hesitate to get back to me if you have any queries.

Kind regards,

Esther Hughes (she/her)

Marine Lead Adviser

Devon, Cornwall & Isles of Scilly Team

Natural England, Polwhele, Truro, Cornwall, TR4 9AD

Mobile 07442 856295

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From: Daniel Hamp <daniel.hamp@ramboll.com>

Sent: 18 August 2022 14:55

To: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>; Sugar, Kate <Kate.Sugar@naturalengland.org.uk>; Black, Gavin <Gavin.Black@naturalengland.org.uk>

Cc: Julia Thompson <julia.thompson@ramboll.co.uk>

Subject: RE: Proposed Transect Locations for Falmouth Docks Development

Some people who received this message don't often get email from daniel.hamp@ramboll.com. [Learn why this is important](#)

Hi Esther,

I hope you're well.

Please can you provide an update on when we can expect to receive feedback from your specialists?

Many thanks in advance.

Kind regards

Daniel Hamp

Graduate Environmental Consultant

M +44 7929342149

daniel.hamp@ramboll.com

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From: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>

Sent: 11 August 2022 11:35

To: Daniel Hamp <daniel.hamp@ramboll.com>; Sugar, Kate <Kate.Sugar@naturalengland.org.uk>; Black, Gavin <Gavin.Black@naturalengland.org.uk>

Cc: Julia Thompson <julia.thompson@ramboll.co.uk>

Subject: Re: Proposed Transect Locations for Falmouth Docks Development

Hi Daniel,

Many thanks for sending this through. I have forwarded it to our specialists, so will await their feedback and then send the full feedback for both the method report and locations asap.

Kind regards,
Esther

From: Daniel Hamp <daniel.hamp@ramboll.com>
Sent: Thursday, August 11, 2022 11:20 am
To: Hughes, Esther <Esther.Hughes@naturalengland.org.uk>; Sugar, Kate <Kate.Sugar@naturalengland.org.uk>; Black, Gavin <Gavin.Black@naturalengland.org.uk>
Cc: Julia Thompson <julia.thompson@ramboll.co.uk>
Subject: Proposed Transect Locations for Falmouth Docks Development

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Hi all,

We have now received the updated scope document from Carcinus which includes proposed transect locations (see attached).

Please let us know if you would us to make any changes to this.

Kind regards
Daniel Hamp

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Ref: Port of Falmouth – Marine Ecological Survey

Dear Sir/Madam,

Carcinus Ltd. have been contracted by Ramboll UK Ltd., on behalf of Falmouth Docks and Engineering Company (FDEC), to undertake marine ecological surveys in support of the proposed development at the Port of Falmouth, Cornwall. Works are anticipated to include an extension to Queen's Jetty, northern infill and dredging of Queen's Jetty, removal of the Northern Arm, construction of a new Western Wharf and dredging of the area around it.

It is understood that no HRO is required for the proposed development as FDEC are the statutory harbour authority and have powers to undertake works under sections 6 and 7 of the *Falmouth Docks Act 1959*, 1959). A marine licence is required under the *Marine and Coastal Access Act 2009* and planning permission from Cornwall County Council is likely to be required under the (*Town and Country Planning Act 1990*, 1990. Marine ecological surveys and sediment chemistry sampling are required to inform both the planning permission application and future marine licence application. Please note that in addition to the marine ecological sampling, samples will also be collected for the purposes of characterising sediments for disposal at a licenced marine disposal site. The process and proposed sample array for the collection of these samples is subject to a separate scope.

We seek advice from Natural England, the MMO and the Cefas Benthic Team on the suitability of our proposed marine ecological sampling plan, as detailed below and within the accompanying information uploaded with this enquiry.

Existing site and background

The Fal estuary complex is situated in southwest England, and the Port of Falmouth is located at the mouth of the River Penryn on the western side of the estuary complex. The estuary at this point is predominantly subtidal, and although extensive intertidal areas exist farther up the estuary complex, the marine environment under consideration here is entirely subtidal. The Fal and Helford Special Area of Conservation (SAC) was designated in 2004 (JNCC, 2004), primarily due to the presence of Maerl Beds of *Phymatolithon calcareum* and *Lithothamnion corallioides*. The Fal complex contains the largest maerl beds in south-west Britain. Maerl beds, both live and dead, provide significant 3-dimensional habitat complexity that supports a high diversity of marine flora and fauna (Hall-Spencer, Kelly and Maggs, 2010).

A bathymetric, multibeam backscatter (MB) and side-scan sonar (SSS) survey of the site was conducted in March 2022. The results of this acoustic survey were used to inform the design of an indicative drop-down video (DDV) survey of the waters around the Port to confirm the presence / absence of both live and dead maerl, characterise the biotopes and identify any notable flora and fauna along a series of transects. This DDV survey was conducted in May 2022 (Report Ref: J0654/22/05/23_Port_Falmouth_DDV_Survey_Report), and the results have been used to help define the proposed scope outlined in this letter.

At present, no proposed dredge disposal site has been identified. At this stage within the project, it is required that we undertake sampling to ascertain if sediments are suitable for marine dredge

disposal and that sampling be combined with the marine ecological sampling programme if possible (to be completed before the end of October to maximise efficiencies). In a separate sampling request to the MMO, we will seek advice in relation to potentially suitable disposal sites within the vicinity of the proposed works and seek agreement on a sediment chemistry survey specification / design.

Survey Operations

Mobilisation for the survey will take place from a convenient local harbour / port capable of accommodating the required survey vessel proposed. At this stage, it is highly likely that the Port of Falmouth will be used for mob/demob and the vessel MV Solent Guardian is anticipated to be used to conduct all survey operations.

Figure 1 shows the proposed sampling/survey locations for the various methodologies described below.

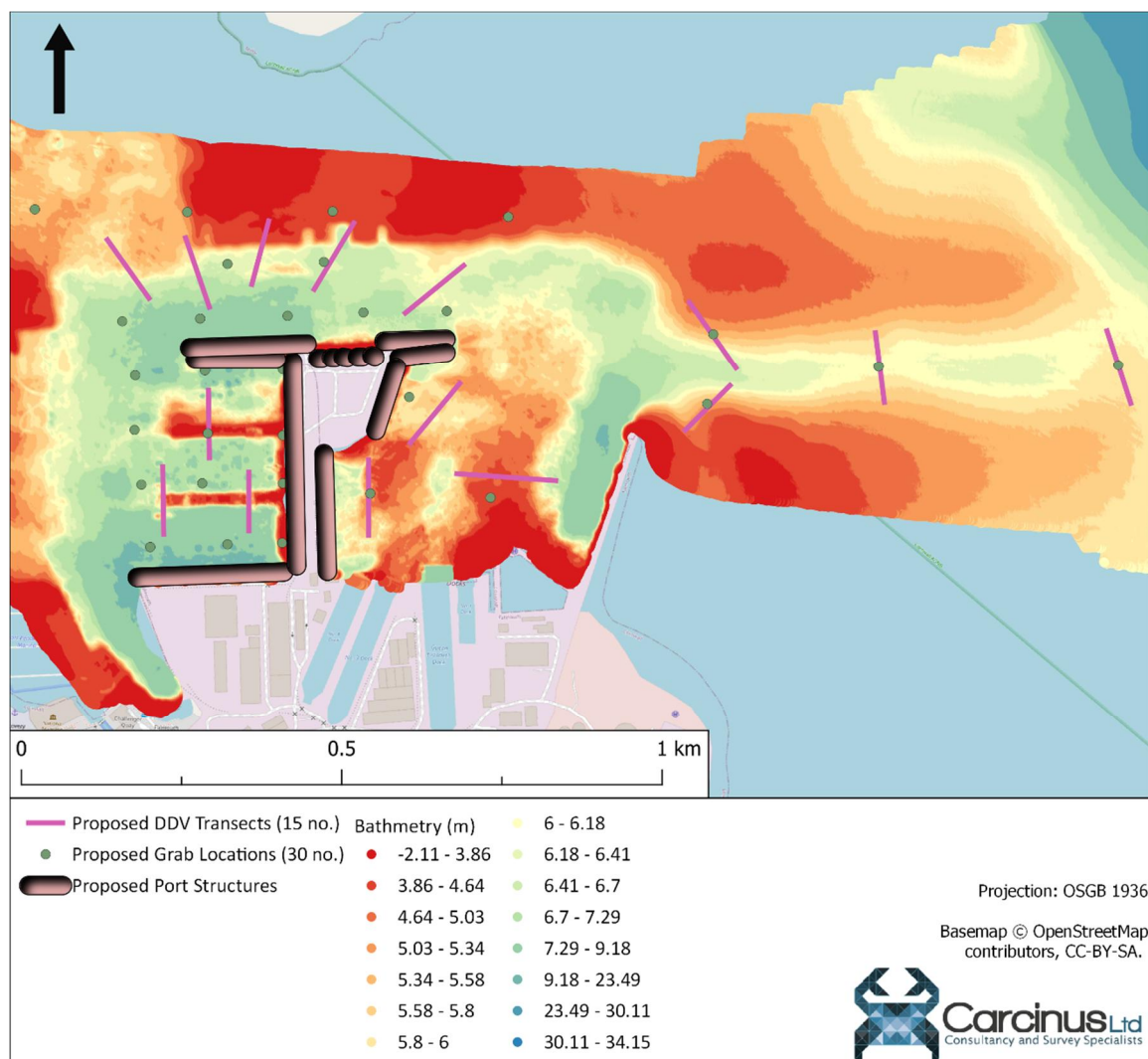


Figure 1 - Proposed locations of various subtidal survey methodologies.

Subtidal Benthic Ecological Survey

A Day grab will be used to collect a series of infauna samples within and around the proposed construction and dredge areas. Given the proposed construction and dredge areas, it is proposed to

collect approximately 30 samples in a pseudo-randomised array across the survey area. A single replicate sample will be obtained at each site. The survey will be undertaken by 2 – 3 experienced marine ecologists. Upon recovery, the grab bucket will be viewed to ensure enough sample has been collected and that the sample has not been compromised in any way.

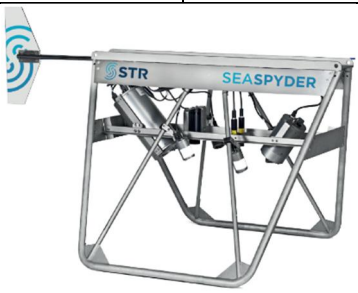
The proposed methodology and survey programme are described in the table below.

Sediment sampling – benthic infauna	
Proposed survey timing	Precise survey timings are yet to be determined. However, once agreed the survey will take consideration of existing vessel traffic. The survey is proposed to take place in September or early October 2022. The study area includes numerous hard port structures which are likely to be subject to wash and seabed disturbance from the movements of existing vessel traffic. Biogenic habitats or macroalgal communities are anticipated. Any stochastic events which may have impacted the benthic environment, such as anomalously cold, high freshwater flows or stormy weather will be considered.
Requirement / approach	To collect samples at selected locations within the study area for macrofauna analysis. Based on our understanding of the proposed development, we have allowed for the collection approximately 30 samples.
Equipment	Samples will be collected using the following apparatus: • 0.1 m² stainless steel Day grab to collect infauna samples; • Sample processing hopper, sieving chute and puddling bin; • 0.5 mm mesh sieve • Vessel RTK GNSS or DGPS (with offset for deployment location); and • Digital deck camera.
Data collection method	All grab samples will be handled in line with Cefas, Ware and Kenny and JNCC guidelines. A Day grab will be utilised to collect infauna samples. It is proposed to undertake sampling at 30 pseudo-randomly selected sites, with one replicate sample obtained at each. Although the precise sampling locations have not been determined, they will take consideration of a range of water depths and habitats within and surrounding the proposed dredge pocket(s). The accompanying plan (Figure 2) shows indicative sampling locations based on current understanding of the proposed development. In addition, sample locations may require micro siting where substrates are unsuitable for sampling by Day Grab, or obstructions to access exist, such as other vessels, moorings etc. The survey will be undertaken by 2 - 3 experienced marine ecologists. They will be responsible for the launch and recovery of the grab and the subsequent sample processing. Prior to deployment of the grab, a Drop-Down Video camera will be used to give an indication of the substrate. This is to maximise the likelihood that a suitable sample will be collected, and to prevent accidental damage of protected live maerl habitats. Upon recovery, the grab bucket will be viewed to ensure enough sample has been collected and that the sample has not been compromised in any way. The following criteria will apply in determining sample acceptability, should any conditions apply the sample shall be rejected: • Sediment washout caused through the grab jaws or doors not closed properly; • Sample taken on an angle i.e. where the grab has not struck the seabed true; • Disruption of the sample through striking the side of the vessel; • Sample too small for requirements (Minimum sample size for 0.1 m² Day grab of < 7 cm bite depth. • Sample is collected beyond positional tolerance (to be within 5m of target location);

Sediment sampling – benthic infauna	
	• The presence of a Hag Fish (<i>Myxine glutinosa</i>) and/or other mucous coagulants; and • Unacceptable to the on-board ecologist or client representative for any other reason. If the sample is deemed acceptable, the sample will be released into a sample hopper and a visual description and photograph taken. Any conspicuous sediment features and obvious fauna will be recorded. The sample will then be processed in its entirety by being sieved through a 0.5 mm mesh (NB: substrate in study area is expected to include areas of soft mud, therefore a 0.5 mm mesh shall be used to ensure greater retention of meiofauna). The sieve will be placed at the end of the sieving chute and rinsed to remove residual sediment via a puddling bin. All sieves used for macrofauna processing will conform to BS410 or ISO 3310- 1 (woven wire sieves) or ISO 3310-2 (perforated plate sieves). Following sieving, the sieved sample shall be photographed while still on the sieve with a photo tag denoting date, station and replicate number. The sample will then be transferred into pre- labelled bucket and preserved on site with 4% buffered saline formaldehyde solution. All necessary PPE shall be worn during sample fixing. During subsequent laboratory analysis to identify the faunal composition, the sample will be divided between >1.0 mm and <1.0 mm individuals to facilitate statistical comparison. This will be done in the laboratory as it would be prohibitively time-expensive and impractical (risking sample loss and poor sieving efficiency) to do in the field. At each sampling site, an additional grab sample shall be collected (adhering to the same sample acceptability criteria outlined above) and a 10 cm hand core taken from surface of sediment to bottom of grab to be processed for sediment Particle Size Distribution (PSD) analysis to support later interpretation of infauna results. All samples shall be analysed to relevant British Standards and NMBAQC methods by a laboratory accredited by UKAS to the ISO 17025:2005 standard.

Drop Down Video

Drop Down Video (DDV)	
Requirement	To acquire data of suitable resolution to enable characterisation of the benthic ecology inhabiting the subtidal rock located to the north of the approach channel.
Equipment	Digital video and stills of the seabed will be collected using the following apparatus (or of comparable performance / specification): • Drop camera system featuring: - 'On-the-fly' image download - Real time video - LED lamps - Dual lasers for scale - High speed digital telemetry link to camera and sensors • ESW-500 Electric survey winch fitted with loadbearing subsea camera telemetry cable; • HYDROpro™ Navigation Software for fixing positions and recording vessel and equipment tracks – accounting for positional offsets; and

Drop Down Video (DDV)	
	Differential (d)GNSS for positioning.
Data collection method	The May 2022 DDV survey covered 25 transects over a relatively wide area. The exact number of transects proposed is not known at this stage, but it is likely that a slightly smaller number of transects will be completed but over a much smaller area (Figure 1 indicates 15 no. transects, although the exact length/position/number may be varied on the day due to on-site conditions and other factors). Please note that the transects will be constrained by the safe operation of the vessel in relation to draught taking account of the depth of water. As such, each transect will not be approximately 100 m in length (with some run-in and out of the transect). It is proposed that a drop system be used with the camera mounted at $\sim 45^\circ$ to produce an oblique image of the seabed. This will give depth to the image to allow a feature's dimensions to be assessed in accordance with the guidelines. Scale will be determined by the in-shot dual lasers. The general method for the conduct of DDV surveying will be based on published NMBAQC Guidance (Hitchin, Turner and Verling, 2015). . The DDV system will be deployed by two experienced marine ecologists with assistance from a qualified survey engineer. Sufficient run-in distance will be given to allow the DDV system to be fully deployed prior to the start-of-line (SOL) ensuring the entire transect(s) is recorded. The position and depth of the DDV system will be monitored in real-time via the output from the dGNSS augmented by the live camera feed. Deployment will stop at ~ 50 cm from the seabed with the vessel moving slow ahead. Recording will commence just prior to the SOL and will end once the DDV system has passed the end-of-line (EOL) with the DDV being 'flown' along the transect. The video will be geo-referenced and contain an overlay delineating the date, time, position of camera, transect number and depth of camera. Data quality will be assessed by the on-board ecologists to ensure sufficient image quality is obtained. Continuous video footage will be collected as well as a series of high-quality stills images. Stills images will be collected throughout each transect as appropriate (i.e., where key features exist, changes in bed composition etc.). Detailed survey logs will be maintained throughout the survey to record transect number, position (start and end of line), time, depth, number of stills and any other noteworthy observations.
  	

Port Inspection

Port Structures: ROV Inspection	
Proposed survey timing	No seasonal restrictions or considerations are required except to avoid sampling immediately after significant storm events where turbidity levels are likely to be elevated. Every effort will be made to run this survey concurrently with the other survey elements to maximise efficiency.
Requirement	During the May 2022 Survey, a brief inspection of the above-water port structures was undertaken. Several of these structures were observed to be in a state of mild disrepair. As a result of this, a more complete inspection of the above and below-water structures will be undertaken during this survey. This survey will incorporate the port structures that extend out into the channel such as the Queens Jetty and the Northern Wharf, as well as concrete walls and piles, and rock armouring within those areas. Where piles/walls are surveyed, a selection of the area will be inspected from surface to substrate. The surveyed areas will be representative of the area but not 100% coverage as it is considered that this would take a prohibitively long amount of time.
Equipment	The following equipment is required: - BlueRobotics BlueROV2, featuring: - A HD 1080p video camera with live feed and overlay of data; - Additional 4K video camera 4 No. 1500 Lumen lights (adjustable brightness) - Depth, compass and attitude data streams - Depth rated to 120m - HYDROpro™ Navigation Software for fixing positions and recording vessel and equipment tracks – accounting for positional offsets; and - Differential (d)GNSS for positional accuracy to <50 cm.
Data collection method and analysis	Footage will be viewed in real time by the on board ecologist to provide a means of recording conspicuous fauna, noting the apparent condition of port structures and monitoring survey parameters (e.g., visibility, camera angle, relative position etc.). A detailed survey log will be maintained throughout the deployment along with the presence of any sensitive nature conservation features, such as Annex I habitats and Annex II species. Data collection via ROV is now an accepted method by the Statutory Nature Conservation Bodies. This is reflected within the industry standard guidance manual (The Marine Monitoring Handbook) produced by the Joint Nature Conservation Committee. All survey operations used during this project will align with those stipulated in the guidance.

Analysis

Infauna samples

To analyse the macro fauna samples collected from the day grab / intertidal cores, a laboratory which is a full-time participant in the UK National Marine Biological Association Quality Control Scheme (NMBAQC) will be used. All laboratory techniques are documented and adhere to NMBAQC protocols and ISO 16665.

Data will be analysed to describe community structure and distribution and to elucidate relationships between faunal assemblages and physical variables. A suite of statistical routines shall be employed to investigate community structure and relationships with abiotic factors where appropriate. The characterisations will include definition of the different types of habitats present and the animal communities that are associated with them. Biotopes will be defined from a synthesis of the physical and biological data and compared to the UK Marine Habitat Classification system.

In addition, all samples will be analysed for Particle Size Distribution (PSD) to provide additional information for interpretation.

Yours faithfully,



Matthew Crabb

Director and Principal Consultant – Carcinus Ltd

References

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Your reference:
Our reference:
ENQ/2022/00146

By email

11 October 2022

Dear Ms Holloway

ENQ/2022/00146 - Enquiry - Falmouth Port Proposed Development - Benthic Survey Proposal

Thank you for the enquiry you submitted on 7 September 2022 regarding the Falmouth Port proposed development.

At a meeting held on 20 September 2022 you explained that you had engaged with Natural England to agree the scope of the proposed benthic survey to be undertaken imminently. You requested that the Marine Management Organisation (MMO) make comment on this proposal.

Following consultation with the Centre for Environment, Fisheries and Aquaculture the MMO make the following comments:

1. The number and locations of the proposed 30 grab stations are generally acceptable. Although this is not formally stated, it is the understanding of the MMO that the grab survey is to acquire samples from which the baseline macroinfaunal assemblages of the sediments that are to be affected by the dredging associated with the works is to be described. 30 grab sample stations is a justifiable number and the MMO is largely in agreement with their locations. A “pseudo-randomised” is totally defensible for the purposes of conducting a baseline characterisation given only depth as the underlying base layer information.
2. However, two comments should be considered before finalisation. Firstly, it is important to ensure that the baseline features of not only the areas that are likely to be directly affected by the dredge are described, but those that are likely to be affected by indirect/secondary impacts of the dredge (e.g., increased suspended solids and/or sedimentation). Without any guidance from sediment predictive



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modelling outputs, the MMO is not in a position to know whether this is captured by the current survey design.

3. Secondly, the grab stations principally appear to be located in areas which, given the bathymetric data provided, undergo maintenance dredging (apologies if this is not the case). Thus, they are likely to be principally sampling altered or disturbed assemblages and the baseline of the undisturbed conditions is not being fully described. The implications of this potential gap are more likely to be an issue if the region of indirect impacts is larger than the footprint of the proposed survey.
4. Regarding the locations of the drop-down video (DDV) transects. The 15 transects again appear to be sensibly positioned, although without further information it is not possible to provide a confident assessment of this. That is, it is noted that the DDV data are to enable characterisation of the benthic ecology inhabiting the subtidal rock located to the north of the approach channel. While this is appropriate, without information regarding the locations of these subtidal rock areas the MMO cannot confidently conclude the 15 transects are appropriately located or whether further refinement is warranted.
5. The MMO consider the proposed timing of the grab survey, for September/October, to be a suitable time of the year to sample benthic invertebrate subtidal assemblages.
6. The methods (including equipment) proposed to sample the subtidal macroinfaunal assemblages are suitable. Standard and well adopted approaches seem to be adhered to throughout each stage.
7. The laboratory procedures outlined to process the macrofaunal and sediment particle size samples and the subsequent data analyses approaches, all appear suitable.
8. The Drop Down Video equipment and approaches including data collection are all sensible, notwithstanding our minor comment regarding DDV station locations (paragraph 4) and follow a standard approach under the NE Atlantic Marine Biological Analytical Quality Control (NMBAQC) procedure.
9. The MMO considers the approaches detailed for the remotely operated vehicle (ROV) to be sensible. However, while the approaches proposed for the ROV survey seem justifiable, without detailed information regarding the extent to which underwater structures will be surveyed it is not possible to ascertain whether the number or amount of hard structures covered by the survey is sufficient. It would also be beneficial for the contractor to have some *a priori* understanding regarding the specific taxa which might be of specific interest in this area during the survey. In this way, it might aid the surveyor ensure that specific types of hard structure or appropriate depths, for example, are particularly focussed on during the survey to increase the chance of observing taxa of importance.
10. MMO considers the analysis of macroinfaunal samples to be suitable. The inclusion of a 0.5mm mesh sieve is sensible and it is recognised that numerical analysis of the data should focus on the data based on a >1mm mesh (to make the data more suitable for biotope assessment, for example).



Conclusion

As indicated through our responses above, the MMO generally endorses the approaches set out for the grab, DDV and ROV survey. However, attention should be paid to ensure that the surveys spatially encompass the regions that are likely to be affected by the indirect effects of the works (not only direct effects). The MMO appreciates that this knowledge might not be available at present (if detailed sediment dispersion modelling has not yet been undertaken).

Yours sincerely



Julia Stobie
Marine Licensing Case Officer

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